

RESPONSE AND REQUEST FOR RECONSIDERATION

The amendments to claims 1 and 12 serve to distinguish over the prior art in more precisely defining the nature of the friction modifier (a). The “consisting of” language serves to exclude additional components from the constitution of the friction modifier (although not from the composition as a whole), and the listing of the specific amino alcohols restricts that portion of the compound. No amendments are made to any other elements. The specific amino alcohols now claimed are taken from the paragraph 0012 of the specification. The identification of branched chain alkyl groups finds support at page 3, lines 9 and 12. The selection of an automatic transmission as in new claims 13-15 finds support in paragraphs 0006 and 0072.

As an alternative, new claim 14 presents a method for lubricating an automatic transmission without the limitation in amino alcohol proposed for claim 1. This is also believed to be distinguished over the prior art.

The Examiner had rejected claims 1-3,6,8, and 10-12 as anticipated by US 4,786,426, Gemmill.

Gemmill discloses lubricant compositions for internal combustion engines. A borated oxazoline monoester is made by reacting a boron compound with the product of reaction between tris-hydroxymethylaminomethane [THAM] and carboxylic acid, in particular, oleic acid. The present claims, on the other hand, exclude borated materials since component (a) of the claims “consists of” the reaction product of the named components. The present claims also specify that the product contains branched alkyl groups, which are not disclosed in Gemmill. Moreover, there is no disclosure of the use of such a material in lubricating an automatic transmission, which is a preferred use of the present invention, as set forth in claim 13-15.

It is noted that Gemmill requires the use of a borated product in order to impart friction reduction. The reference itself provides a comparison showing that a non-borated material is not as good for use in a crankcase lubricant. There is thus no motivation to select a non-borated material for the present lubricant formulation.

As to the issue of branched chains, naturally occurring fatty acid are generally linear, as are all those disclosed in Gemmill. Nevertheless, the present inventors have selected the non-naturally-occurring branched chains in order to impart improved oil solubility to the product as well as to the reactants.

Also, the present requirement that the substituents are “alkyl” groups indicates that they are saturated groups, rather than unsaturated “alkenyl” groups. While there is a general disclosure in Gemmill of both saturated and unsaturated groups, the oleic acid which is actually employed is unsaturated and thus excluded from the present claims.

The selection of saturated alkyl groups is important particularly in an automatic transmission lubricant. While the crankcase lubricants of the references are designed to have a lifetime of only a few thousand kilometres or a few months, most modern automotive transmission fluids are “fill-for-life” fluids. As such they are intended to remain in service for the life of the vehicle, which can be in excess of 200,000 km and 5, 10, or even 15 years. These long years of service in an oxidizing environment can lead to significant degradation of oxidatively unstable unsaturated materials. Thus, oxidation of the hydrocarbyl chains of the friction modifier can lead to loss of friction modifying ability well before the end of the lifetime of the vehicle. The use of saturated or alkyl chains minimizes this problem.

The method claims are additionally now amended to limit the devices in which they are to be used to transmissions, tractors, gearboxes, or bearings, of which automatic transmissions are one important type (claims 12 – 15). The environments of and expectations for each of these applications, and in particular an automatic transmission, are so very different from what is encountered for the reference crankcase lubricants, as discussed above, that the skilled person seeking to lubricate an automatic transmission would scarcely look to a crankcase lubricant for inspiration. Even less is there any expressed motivation to exchange the exemplified oleic acid reactant with a different acid supplying branched alkyl groups to the product.

Therefore, it would not be obvious, starting from the teachings of Gemmill, to prepare a composition as presently claimed, as a lubricant suitable for use outside a crankcase, especially as a transmission lubricant.

The Examiner had also rejected claims 1, 6-8, and 10-12 as anticipated by Papay, US 4,239,432.

Papay '432 discloses reduction of friction in an engine crankcase using a formulated motor oil containing a small amount of the reaction product of a fatty acid and monoethanolamine. It also discloses that most preferred crankcase oils also contain an ashless dispersant such as polyolefin-substituted succinamides and succinimides. There is no disclosure of the aminoalcohol species of the present invention nor of the use of the material as an automatic transmission lubricant. Moreover, there is no motivation to make the numerous changes required to arrive at the present invention.

The Examiner had also rejected claims 1-2, 4, 6, and 10 as anticipated by Horodysky, US 4,617,133.

Horodysky discloses lubricant additives comprising oxazoline salts of acid phosphates derived from hydrocarbyl diols. In one example, an oxazoline is prepared from oleic acid, isostearic acid, and trishydroxymethyl aminomethane, and this

intermediate is reacted with an acid phosphate of mixed 1,2-pentadecanediol-1,2-octadecanediol. The resulting salt is the subject of Horodysky's patent and is subjected to friction testing and wear testing in Tables 1 and 2. It is noted that nowhere in Horodysky is there disclosure of his oxazoline, apart from the phosphorus salt, being employed. The present claims, being restricted to the recited reaction products, do not encompass the salts of the acid phosphates as disclosed in Horodysky. Moreover, as the phosphorus component appears to be essential for the antiwear and friction performance of Horodysky, there is no motivation to employ an unmodified oxazoline. Furthermore, the oleic acid exemplified in Horodysky is neither branched, as presently required, nor is it saturated (so as to provide an alkyl, rather than alkenyl group). Thus, there is no motivation to arrive at the present invention from a consideration of Horodysky.

Accordingly, the claims, as amended, are neither anticipated nor made obvious by Gemmill, Papay, or Horodysky.

Certain of the dependent claims were also rejected as being obvious over a combination of references. Thus, claim 5 (specifying isostearic and octadecylsuccinic acid) was said to be made obvious by a combination of Horodysky and Bridger, US 4,162,224; and claims 7 and 9 (type and amount of dispersant) were said to be made obvious by a combination of Gemill with Papay, US 5,652,201.

Each of these claims, being narrower than the independent claim from which they depend, will likewise be unobvious for the same reasons as those set forth above for claim 1.

Conclusion.

For the foregoing reasons it is submitted that the present claims are in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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